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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/412,510 10/05/99 ITOH

K 0756-2045

IM22/1022  
SIXBEY FRIEDMAN LEEDOM & FERGUSON PC  
8180 GREENSBORO DRIVE  
SUITE 800  
MCLEAN VA 22102

EXAMINER
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PADGETT, M	
ART UNIT	PAPER NUMBER

1762  
DATE MAILED:

10/22/01

*22*

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

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## Office Action Summary

Application No.

09412,570

Applicant(s)

Itoh et al

Examiner

M.L. Padgett

Group Art Unit

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— The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address —

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- ☒ Responsive to communication(s) filed on 9/12/01, 9/24/01 and interview 9/27/01
- ☐ This action is FINAL.
- ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

## Disposition of Claims

- ☒ Claim(s) 20-41 is/are pending in the application.
- Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- ☒ Claim(s) 20-41 is/are rejected.
- ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- ☐ Claim(s) \_\_\_\_\_ are subject to restriction or election requirement

## Application Papers

- ☐ The proposed drawing correction, filed on \_\_\_\_\_ is ☐ approved ☐ disapproved.
- ☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner
- ☐ The specification is objected to by the Examiner.
- ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. § 119 (a)-(d)

- ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119 (a)-(d).
- ☐ All ☐ Some\* ☐ None of the:
- ☐ Certified copies of the priority documents have been received.
- ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_
- ☐ Copies of the certified copies of the priority documents have been received

In this national stage application from the International Bureau (PCT Rule 17.2(a))

\*Certified copies not received: \_\_\_\_\_

## Attachment(s)

- ☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). 17,18
- ☒ Interview Summary, PTO-413
- ☒ Notice of Reference(s) Cited, PTO-892
- ☐ Notice of Informal Patent Application, PTO-152
- ☐ Notice of Draftsperson's Patent Drawing Review, PTO-948
- ☐ Other \_\_\_\_\_

Office Action Summary

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1. The oath or declaration is defective. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application number and filing date is required. See MPEP §§ 602.01 and 602.02.

The oath or declaration is defective because:

It does not identify the foreign application for patent or inventor's certificate on which priority is claimed pursuant to 37 CFR 1.55, and any foreign application having a filing date before that of the application on which priority is claimed, by specifying the application number, country, day, month and year of its filing.

- 1/24/02*
2. Claims ~~1~~<sup>20</sup> and ~~18~~<sup>20</sup>-41 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In all the independent claims, 20, 23, 25, 28 and 31, the phrasing describing the positioning and cross-section of the plasma is vague, indefinite and confusing, because appropriate context or consideration of the plurality of inlets has not been provided by the claim language. The present language creates uncertainties and ambiguities in meaning, as written, that can read on options that do not appear to be intended, such as the elongated cross-section extending from the first to the second electrodes, when the first direction is left essentially undefined, i.e., without appropriate context. It would appear that the above problems could be corrected and the claims put in condition for allowance with the following amendments (or

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equivalent ones) to the claims, plus submission of appropriate terminal disclaims (see sections 3-4 and 6). Note other minor clarity problems have also been included below.

In claims 20, line 5 delete "reactive"; in line 6 insert --at each of the plurality of the inlets-- after "wherein"; in line 7 insert --at each said inlet-- before "across"; and in line 9, change "the cross section is " to --each of the cross-sections are--.

In claim 23, line 3 after "direction" insert --along planes of the electrodes--; in line 11 after "direction" insert --and parallel to the first electrode-- (otherwise the second direction could refer to the distance between the electrodes, which appears to lack support for claimed relative dimensions); in lines 12 and 13 after "wherein" and "plasma" insert --at each of said inlets--, respectively.

In claims 25, line 3 insert --along planes of the electrodes-- after "direction"; in line 6 after "wherein" insert --at each of said inlets--; and in line 9 after "direction" insert --and parallel to the planes of the electrodes--.

In claims 28 and 31, lines 4, insert --at least one-- before "inlet"; in lines 6 insert --at each said at least one inlet-- after "wherein" and also in line 7 before "a cross section"; and in lines 8 insert --and parallel to the electrodes,-- before "where".

In claim 32, change "said gap" to --a gap between said first and second electrodes-- to correct the lack of antecedent basis.

Claim 40 is objected to under 37 C.F.R. 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the

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claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. The independent claim 31, already contains this limitation of claim 40 in lines 10-11.

Note that as presently written (as opposed to intent) claim 20 requires that there be a single elongated cross-section in the claimed planes, but plural inlets so that what scope is literally covered by the confusing language is hard to determine in a meaningful fashion, but the other sets of claims, do read on other determinable configurations, hence such options will be treated below.

3. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CAR 1.321© may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CAR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CAR 3.73(b).

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims ~~1~~<sup>20</sup> and ~~18~~<sup>20</sup>-41 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-25 of U.S. Patent No.

*Handwritten:*  
1/21/02

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6,001,431. Although the conflicting claims are not identical, they are not patentably distinct from each other because: alternative equivalent wording, and different orders of claiming, do not produce claims with significantly different meanings, nor does the claim of a gap dimension by itself, or the use of plural generic inlets; or specific gas pressure. Note that while the patent claims contain more limitations or description than the present claims, except for those listed above, all features of the instant claims are contained in the patent claims. Also note, that as there is no clearly recognizable difference between "raw material gas" and a "reactive gas," they cannot be considered to be distinguishing features. Note that the (431) patent claims treating, that may be etching and causes ashing in their claims 22-23, as well as the option of forming a DLC film.

The claim of a single dimension of the apparatus and none others, lacks significance, as there is no context to make such meaningful. Specifically, specifying use of a specific gap size when the size of electrodes, chambers and substrates, etc... to be treated are unknown, when the materials (substrate and gas) are unspecified, when the affect of the plasma treatment is not defined, has no identifiable significance. One of ordinary skill would use electrodes with the gap between adjusted according to all of the above considerations.

While the patent claims do not claim: (1) specific pressures in the chambers; or (2) a plurality of generic gas ports used in the process, these claimed limitations would have been obvious to one of ordinary skill in the art, because (1) the pressures used in the plasma process would have been optimized for desired affects, particular gases and chamber configurations; and (2) patent's claim 5 generates a plurality of sheet beam plasmas from "slit-like inlets" (plural),

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hence the claim of a plurality of generic gas inlets does not give any specific effect not already claimed in the parent patent. Note, the formation of multiple successive planes of plasma as in patent claim 5, or the use of multiple closely spaced gas inputs that each produce the same gas flow effect as a single continuous slit, (which relates to previous more specific claim language) are functionally equivalent.

5. Art cited for showing the use of roll to roll feed as previously claimed includes Takahashi et al, Muria et al and Fujioka et al, and remains relevant to the claim of moving substrates and magnetic tapes.

6. Claims 20-34, 36, 38 and 40 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-2, 4-5, 7-9 and 11-15 of U.S. Patent No. 6,001,432. Although the conflicting claims are not identical, they are not patentably distinct from each other, because the presently claimed subject matter is presently claimed in different orders, or overlapping ranges, such as with different phrasings that cover equivalent meanings, like "openings that is elongated in a first direction". Also, obvious arguments for conventional features as discussed above also apply.

7. Claims 20-34, 36, 38 and 40 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 3-4, 7, 10, 13 and 17, or claims 1-2, 7-8, 10-12, 16, 17, 20-24 and 27-68 respectively of U.S. Patent No. 5,766,696 or No. 6,183,816 B1 in view of Jansen et al., optionally consisting of Yanagihara et al., as applied in Sections 8 and 9 below.

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Further note in Yanagihara et al that the shaping of the electrode to match the substrate configuration is analogous to what is done by Itoh (696) as seen in Fig. 2 (Itoh), and Fig. 9-11 (Yanagihara), and that the secondary reference further teaches making a composite electrode structure of multiple electrodes or alternately or single electrode with slots, providing further motivation. As pretreatment of substrate materials is frequently used for improving adhesion of subsequent coatings, such procedures would have been expected to be useful in the present invention for their conventional purposes.

8. Claims 25-33, 37, 39 and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jansen et al.

Note that Jansen et al has an effective filing date before applicant's filing date, but after the priority document that does not presently have a certified translation. Also, note that the above suggested clarifying amendments would remove this rejection over Jansen et al.

In Jansen et al, see the abstract; Figs. 1-5, esp. 4; col. 1, lines 8-12; summary; col. 2, lines 50-67; col. 3, esp. lines 8-27 and 52-64; col. 4, esp. lines 9-34 and 45-56, for teaching of a cathode opposed to a substrate that is passed over a magnetic assembly (26) and may be grounded, hence effectively may be considered to be opposed to another electrode. The cathode has openings that emit plasma precursor gases such as oxygen, used for etching substrates to remove materials such as oxides or hydrocarbons, hence reading on "ashing". Suitable distances between the openings in the cathode where the plasma is produced and the substrate are taught to be about 0.5 to 1.5 inches or about 12.7 to 38.1 mm. While these values just miss overlapping



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with 10 mm, the claimed values would have been expected to be obvious as within the realm of optimization due to apparatus and substrate dimensional variations. Pressure is taught to be an important factor in producing good cleaning, with pressure of about 0.1 to 5.0 Torr said to be sufficient for desirable gas flow. Jansen et al teach and show multiple openings for gas inlets and where plasma is produced, or as in Fig. 5 multiple apparatus. While cross-sections as claimed are not discussed, Fig. 4 shows a single cross-section that reads on the claimed cross-section as written. It would have been obvious to one of ordinary skill in the art, that given. Jansen et al's teachings, that each of the illustrated openings would have been expected to produce plasma plumes as illustrated in Fig. 4. Also, while Jansen et al do not discuss the plasma contacting or not contacting the substrate, they do teach the length of the plasma emission being adjustable, especially by pressure and hole size, and the need for optimization for good cleaning, hence it would have been obvious to one of ordinary skill in the art to optimize the plasma emission length according to the particular desired effect and materials of both the plasma and the substrate being treated. Further, contacting or not is clearly a capability of the apparatus, and doing so or not, would have been expected to depend on the chemistry and sensitivity of materials involved.

9. Claims 23-24, 36, 38 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jansen et al as applied to claims 25-3, 37, 39 and 41 are above, and further in view of David et al "Plasma Deposition and Etching...", optionally considering a Yanagihara et al and Takahashi et al.

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Jansen et al teaches plasma treating, but does not discuss CVD or DLC coating, however David et al teaches both DLC coating and O-plasma etching in parallel plate plasma reactors (page. 368 - Exp. methods; page 37 - oxygen plasma etching) sufficiently analogous to apparatus of Jansen et al, that one of ordinary skill would have expected the primary reference to be effectively employed in such CVD DLC coating operations, hence obvious to use for such, as suggested by the overlapping usages.

Optionally, plasma process are being discussed as Yanagihara et al uses carbon-coating source gases, and may deposit diamond-like carbon (abstract; col. 1, lines 5-15; col. 3, line 15- col. 4, line 26; and claim 17). Processes that also have holes, as in Yanagihara et al's sheet electrodes, may be a plurality of holds or parallel slits (Fig. 2, col. 5, lines 13-49 and col. 6, lines 27-30), hence demonstrating known use of such configurations in DLC coating. Note that the microwave energy applied to the discharge electrodes of the secondary reference, are a range of high frequency or R.F., hence principles discussed therein would have been relevant to the primary reference. Further note that average pressures shown in the tables in Yanagihara et al are all within the bounds of those claimed by applicant, providing evidence of the known usefulness of such pressure values for at least DLC deposits.

Notice is taken that use of DLC on Magnetic disc or tape as protective layers is old and well known, or alternately as previously applied (paper No. 13, section 6) Takahashi et al teach plasma deposition of such plasma layers, providing motivation for use thereon, via any applied plasma deposition process.

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10. Claims 20-41 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The unclear phrasing rejected in section 2 above, can be considered to include subject matter not disclosed by the original specification, because as exemplified by claim 20, as it now reads, multiple slits can make a single elongated cross-section, which is contrary to disclose as represented by Fig. 2. In the other independent claims, the dimensions claimed for the second direction, can be applied to the gap distances, as opposed to the width as refined by the above amendments. While these meanings do not appear to have been intended, as written the claim can be considered to contain such, which appears to be New Matter.

11. The references of von Campe et al and Shimatani et al cited by applicant, are noted to be relevant for their use of slits, but lack teaching of cross-sections as appear to be intended. Whether von Campe et al as exemplified by the electrode of Fig. 5, which may have slits or holes and produces an even gas distribute, could depending on dimension be considered to create a cross-section as claimed in 20, is unclear due to the uncertainty of that claim's language.

Other art of interest includes Gut et al, Mori and Sindzinger et al, who produce defined plasma regions of interest, but either are not prior art and/or do not appear to read on the claims as written or intended.

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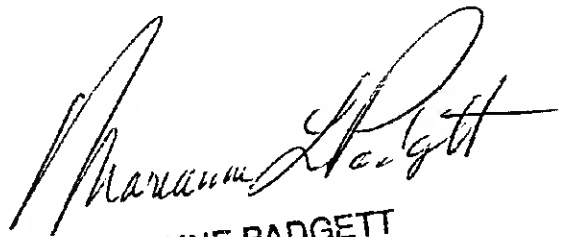
12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to M. L. Padgett whose telephone number is (703) 308-2336. The examiner can normally be reached on Monday-Friday from about 8:00 a.m. to 4:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, , can be reached on (703)308-2336 . The fax phone number for the organization where this application or proceeding is assigned is (703) 305-5408 (official) or 305-6078 (unofficial).

M.L. Padgett/dh

October 15, 2001

October 19, 2001

  
MARIANNE PADGETT  
PRIMARY EXAMINER  
GROUP 1700